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THREE ARTICLES FROM VOYENNNY VESTNIK: (1) INDEPENDENT  
WORK BY TRAINEES; (.. (U) ARMY FOREIGN SCIENCE AND  
TECHNOLOGY CENTER CHARLOTTESVILLE VA.

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US ARMY INTELLIGENCE AGENCY  
FOREIGN SCIENCE AND TECHNOLOGY CENTER  
220 SEVENTH STREET, NE.  
CHARLOTTESVILLE, VIRGINIA 22901-5396

FSTC-HT-0098-87

DATE: 7 Jul 1988

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ENGLISH TITLE: Three articles from *Voyennyy vestnik*: 1) Independent work by trainees; 2) The competitive force; 3) Firing and ranging data reduction device.

TRANSLATION OF: *Voyennyy vestnik*. 1986. No. 12, 49-51, 52-53, 58-60.

LANGUAGE: Russian. COUNTRY: Union of Soviet Socialist Republics.

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TRANSLATION ACC #



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## INDEPENDENT WORK BY TRAINEES

Colonel S. Sverdlov, Moscow Military District

Voyennyy vestnik, No. 12, 1986, pp. 49-51

In our Kolomna Higher Artillery Command College imeni October Revolution, just as in other similar educational establishments, independent work by trainees is regarded as one of the integral parts of the teaching process and therefore is carefully scheduled and organized. We begin from the fact that the future officers in the junior courses do not yet have the ability to properly distribute their time and do not possess stable habits of independent work, and moreover their general-educational preparatory levels are not the same.

For these purposes, we strive to teach trainees, first of all, to schedule their work with allowance for time; secondly, to use the most effective procedures and operating methods with teaching material; thirdly, to stimulate in them interest in the discipline under study and to persuade them of the need of this knowledge for their subsequent activity in the military; fourthly, to counsel them about which materials must receive their additional attention; and, fifthly, to provide each with necessary literature and a place in a given class. — to p. 2E

We have in mind the following kinds of scheduling: long-term (semester), ongoing (monthly), and detailed (daily), which is revised on a daily basis. In order to upgrade the quality of activity, we furnish trainees with the necessary starting data. We give them the semester listing of exercises and training sessions, which is the principal document. We familiarize them with the plan for party-political, educational, and mass sports activities, with the schedules for details, we communicate to them how much time is allotted for a particular discipline in a semester, what are the forms and schedules for making reports, the average time norms for preparing material for a two-hour lecture and for reading one page of a textbook (the latter is revised individually with a timer). Naturally, this requires a well-defined and coordinated operation of all departments and services taking part in organizing the teaching process.

Now, about the psychological aspects of the matter. If the student does not experience interest in the discipline under study, he will not work conscientiously on its textbook problems. So both the instructors and the commanders, and the party and Komsomol organizations strive to foster in the trainees the necessity of persistently mastering the relevant knowledge. They act unitedly, in achieving an active, involved attitude toward learning. The instructor's influence is the strongest. A lecture that is profoundly reasoned, abounding with concrete examples and facts not only leaves a deep trace in the student's consciousness, but also spurs him to delve thoroughly into textbook problems. And if the one who teaches has enough tact, patience, and experience in order to prompt at the right time, and how one can independently deepen one's knowledge, the results will be better still.

Accordingly, it is very important, in our view, to take into account the traits and principles of human mental activity, on which the theory and practice of stage by stage consolidation of knowledge and skills are based. By giving the future officers advice about the technique of independent work, we above all are talking about the capabilities of human memory, its development and strengthening. With this aim, let us use a table showing the losses in information acquired as a function of time.

TABLE

а Время, прошедшее с момента получения информации, ч	0	0.3	1	9	24	48	144
б Объем информации, сохранившейся в памяти, проц.	100	53	44	36	34	28	25

Key: a. Time elapsing since the information was acquired, hours  
b. Volume of information retained in memory, percent

From it we see that more than half the information is forgotten in the first hour after the lecture or exercise. By the end of the second day, however, only 30% of the volume of information is retained in memory; logical relations are lost. So, the optimal periods of reinforcement (repetition) of the acquired information are not later than 7-9 hours after the exercises were concluded. During these periods we in fact recommend that independent work be started, beginning with what had been studied at the beginning of the learning day.

But even with well-laid-out independent work, we advise the trainee as follows: by scheduling what and when he will be engaged with, consider that during the day there are hours of greater or lesser activity for individuals; the first period of upsurge is from 8 o'clock in the morning to 11-12 o'clock noon, and the second upsurge period is from 16:00 to 19:00 to 20:00 hours.

Let us recall one more fact: the volume of assimilated information and the strength of its memorization depend on the number of repetitions. It would appear that this is clear to everyone, but our experience reveals that many young people judge how effective a repetition is after a rapid self-check, forgetting the weak strength of the just-recently acquired, more correctly, once-repeated knowledge.

All the best of advice will not bear fruit if the volume of the exercise in self-training will be in excess of the optimal volume. It is undesirable if the exercise is short and uncomplicated. This fosters excessive self-assuredness.

We recall that a trainee does not have much time for independent work. So we carefully select his material. Exercises are differentiated also as a function of how well prepared the trainee is. And in order that the future officer can evaluate the quality of his work during his self-learning, we propose questions for his self-monitoring; the number of these questions is determined by the kind and complexity of the material.

By helping the trainees to master the ability to work independently, we tell him: By reading the material a few times, you will single out the most meaningful parts, set up logical connections between them, and also between what you are now studying and what you have already studied.

Deriving formulas is best done without relying on the summary. But if there are serious difficulties, the summary can be delved into. We instruct in how to analyze graphs and tables during reading. After the theoretical part has been elaborated, we propose turning to the solution of the problems, with the optimal pathway of mental operations, penetrating the physical meaning of the answer worked out.

Thus we instruct trainees to operate under a quite productive scheme: investigate the conditions given for the problem, when the main thoughts are written down, seek a method for reaching the goal and devising a plan, solving the problem, and analyzing the solution reached.

On completing the work activity with the material, we recommend self-monitoring--by answering questions from the instructor. And here it is useful to turn for help to a comrade in order to hear an evaluation of one's own knowledge. This method of checking how far information has been assimilated was praised by N. K. Krupskaya. She wrote: "It is very important to present to each other material that has been read. Thus one learns to talk about the important, central questions, in checking oneself to see how far one has mastered what he has read. It works out like this: you read as if you understood everything, and you begin to expound, and then you see: some places have not been remembered, some places are not clear enough.

"Working by twos can be very helpful in this respect".\*

But if we talk about instructing trainees for practical exercises, for example, training in firing and fire control, where fire missions will be

\* Krupskaya, N. K., Pedagogicheskiye sochineniya [Pedagogic Works], volume 9, Izd-vo Academy of Pedagogical Sciences, 1960, p. 779.

carried out, then, besides studying the appropriate statements in Pravily strel'by i kursa podgotovki artillerii [Regulations for Firing and Artillery Preparatory Course], one must work out mentally actions in situations in which an officer in charge of firepower may find himself. As shown by our experience, this method of training promotes greater psychological stability. In itself, it is quite simple and consists of the following. The trainee mentally draws a picture of the fire mission to be executed, more correctly, one of its episodes, where he will be required to quickly answer the question: "What and how must I do in order to correct a situation and try to perform the fire mission as efficiently as possible?" If the future officer succeeds in working out, besides all else, his own actions in out-of-the-ordinary situations, he will find himself more prepared for actions on the "battlefield" since this situation will be familiar to him.

Let us examine some similar examples. Let us assume that we have completed the first firings at calculated settings and as a result one of the following observations is obtained:

- a burst deviated from the target in direction (the magnitude is known), the sense of the burst is not known;

- the sense of the burst as to range (plus or minus) is estimated;

- the sense of the burst as to range is estimated and the lateral deflection is measured (four standard variants);

- no burst of the round was spotted;

- the round hit the target.

The last two situations are encountered relatively rarely and they can be called quite nonstandard. Let us mentally think through the actions of the commander executing the fire mission in such cases.

If the round hit the target, this means that ranging has been completed and firing for effect must commence, the command "Battery, two (three, four) round, gun fire" must be sounded.

But when the burst was not seen, the command to the fire position is this: "Check settings" and the accuracy of their is estimated. By receiving a report from the observation post, the data received are checked with available data. If everything is okay, one again commands: "Fire". If there is an error, it is to be corrected (the command is: "Correct settings") and firing again begins. If an error is determined in the settings, the correct settings are passed on to the fire positions and the command "Fire" is given.

In conclusion, I would like to note that the interests of our concern demand that we, instructors, give greater attention to the independent work of trainees. Future officers need to be able to systematically and thoroughly master the art of acquiring knowledge. Perhaps a specialized course should be introduced in the higher military educational centers.

## FORCE OF COMPETITION

Captain I. Alekseyev, deputy commander of artillery division, political section,  
Leningrad Military District

r. 8. 2 Voyenny vestnik, No. 12, 1986, pp. 52-53

→ When senior lieutenant V. Muratov began exercising the duties of commander of one of our batteries, things in the battery went poorly, to be frank. The subunit lagged behind in several indicators, including in specialized training. We tried not to link the new commander's initiative in seeking for means to straighten out the situation faster. To our overall satisfaction, Muratov made his very first moves quite assuredly.

→ It was necessary to activate the human factor, and the officer decided to begin analyzing the way the socialist competition was getting along. To clear up the situation, he studied the appropriate documents and repeatedly had serious talks with the soldiers and the sergeants. He set himself the goal of penetrating as deeply as he could into the individual and collective obligations, of weighing the achievements of each and all together in order to maintain a dialogue persuasively about ways of improving the way things were going in the battery. to p. 24

In this situation it was important to clear up the position of the officers and to convince them that the battery could not score successes if the organization of the competition was not straightened out. The officers responded properly to the criticism and became involved in discussing the problem of activating the human factor.

The session of the Komsomol bureau also proceeded enthusiastically. The latest reports about the results of each teaching day showed up in the Lenin room; battle sheets were now posted regularly; the wall newspaper was laid out in a better format.

And the battery commander began working hard with his subordinates on a one-to-one basis. In confirming the lesson-plans of the officers, he appraised them relative to the organization of the competition; he persistently demanded and is now demanding that the lesson-plans take into account the achievements of the squads and the detachments; the indicators of platoon movements to

designated front lines. By checking, let us say, how troops in the guard or in another detail performed their service, he helped officers and sergeants even in this area to organize competition by intelligently and objectively summing up the results.

Senior lieutenant Muratov continually taught his subordinate commanders also by personal example. Thus, in carrying out the exercise in specialized training, he showed how even when laying out the task stemming from the mission it is necessary to dispose individuals to struggle for high achievements in elaborating teaching problems; he never failed to repeat the results of the last teaching day and to name those who succeeded in making a breakthrough. He pointed out what must concretely be done by the troops today and he oriented himself to seeking out reserve potentialities in combat action and to shortening the time needed to carry out tasks and standards.

The battery commander does not look at it as a mistake if the leader of an exercise once in a while interrupts the actions of his personnel to bring up the best soldiers as an example, to announce their accomplishments, and to call on all to follow the example of the advanced soldiers. Once when a file was about to carry out the task of firing by direct laying, the job was not followed through. The outcome of the firing was below expectations. Then senior lieutenant Muratov designated sergeant M. Naumov as the gunner. The latter had recently joined the subunit, but he had already proven his ability to tackle involved problems of command. He did not quail at them this time either. The target was struck with the first shot and at the maximum range. The example of the exemplary execution of a fire mission made the right kind of impression on the men. And when the sergeant explained how he had done it, the results for the others improved as well. It turned out that in principle both the soldiers had been prepared fairly well and the commanders knew their duties. There was simply a lack of impetus; there was not enough knowledge about the best procedures in combat activity. The competition that was gearing up between squads made it possible to sharply boost the effectiveness of the exercise; the results of the exercise were that very day reported in a special edition of the combat bulletin.

Here is one more, it seems to me, interesting example of the skillful use of a knowledge of human psychology to upgrade their involvement. Somehow senior lieutenant knew that some soldiers had lost interest in what was happening at the fire position. Apparently, they had decided they had already had accomplished a lot and they could slacken off their combat hardening for reaching higher indicators. Then Muratov put together a squad that he headed himself. Into it went also the best specialists in artillery, sergeants A. Aleshin and D. Chabalashvili. And now the command resounded. The command squad commenced carrying out its standards and displayed models of combat activity. This made a deep impression on the personnel. Everything was done with a deftness in spirit, both officers and sergeants.

After the set break, the exercise was completed. The competition markedly intensified. Everybody tried to outdo the achievements of their senior comrades. By using rational procedures, the subordinates of senior sergeant V. Veselov and sergeant Yu. Stepanov gained successes. Muratov directed the attention of the platoon and squad commanders to the experience of the victors. On his order, once more they demonstrated how individual and collective tasks are to be carried out.

In this respect I wish to emphasize that the developing atmosphere of universal effort to work out the teaching problems as best as possible and to raise the productivity of exercises and to bring about order in the battery, compelled one to give thought to improving forms of competition. This is how the idea of taking into account, when summing up the results of competition, whether the advanced troops shared their experience, whether they assisted those lagging behind. Today, if one wishes to rank among the front-rankers, it is mandatory to bring in one's oar into the teaching situation and to train comrades who have not yet reached their level in training. This would not appear to be something new, but when more attention began to be given to instances of some men helping others, activity in disseminating the leading experience quickened up considerably. Thus, the layers, privates A. Kolomiytsev and A. Sokolov, decided to help private A. Grudinskiy. And very soon the soldier turned up in the same rank as the best men in the battery. After some time, his name was now alongside the names of lieutenant G. Alimbarashvili, senior sergeant S. Bagretsov, and other "outstanding soldiers" in combat and political training, in the stand in the Lenin room.

Today we can very justifiably state: the situation with senior lieutenant Muratov and his subordinates is proceeding successfully. And it is an example of an integrated exercise occurring against a very involved tactical background.

On the eve of this exercise, short, well-prepared meetings were held in each platoon and squad. They were very useful. First of all, here the men learned about the forthcoming field exercise and the training missions. Secondly, individual and collective obligations were committed to and the men urged each other on to the competition. All this was arranged so that the struggle took on a concrete form and had well-defined landmarks.

The first intermediate results were summed already in the vehicle park, when the training of the personnel and the preparation of equipment for moving out to the field were evaluated. Then, right before moving into the fire position. By assembling the officers and sergeants, the battery commander declared that some of them together with his subordinates would move ahead depending on the course of actions during the march, and others would lag behind because of the mistakes they made. The squads of senior sergeants Bagretsov and M. Shubin became the competition leaders. And when the command to take positions was spoken, the competition stepped up with even greater momentum. No one wanted to give ground in terms of mastery and teamwork. How the competition came off was communicated by the battery commander to his personnel as the main standards were carried out.

When firing readiness was reported, the leaders changed places. And here is why. The subordinates of senior sergeants Bagretsov and Shubin made a number of errors in the race for speed of execution of standards. Sergeant Alechin's squad came in first; his squad not only clipped the time set by the standards, but also performed them with high quality.

## DATA REDUCTION DEVICE FOR FIRING AND RANGING

Major V. Kravets, Kiev Military District

Voyenny vestnik, No. 12, 1986, pp. 58-60

### 2 Purpose and Layout of Device

The device is designed for determining settings for firing, ranging, and monitoring the accuracy of data prepared on the PUOD [expansion unknown] (ОП [fire position]). *Russian translations. (SDU)*

The instrument (Fig. 1) consists of a base (1), plotting board (2) with rotating celluloid circle (3), and cursor (4).

The base is a U-shaped structure within which a plotting board with a circle can travel. On its left part there is fastened a range rule, on the right--a plate with data from the firing table (each charge has its own overlay). On the upper part a transverse rule with a coordinate scale is secured; with this rule the position of the target when determining data is fixed.

Vertical parallel lines are blackened on the plotting board under the rotating circle fastened on the plotting board. The scales  $\Delta\kappa$  and  $B$  for entering the points  $U$  [target] and  $ОП$  for given  $\alpha_u$ ,  $\Delta\kappa$ ,  $B$ , and  $\alpha_B$  are laid out along the central line. Above and beneath there are two fixed verniers for the more exact setting of the grid bearings on the circle (above) and for determining the map shift (beneath).

The cursor is a rule traveling in the vertical plane and is intended for fixing the point  $ОП$ . On it the noncoded coordinate scale is subdivided.

The device parts are made of white polystyrene (a lightweight metal can also be used for this purpose) and are cemented with Feniks cement. The dimensions of the device are 300 x 300 mm (scale 1:50,000); weight, 0.5 kg. The accuracy of the measurands is as follows: 20-30 m as to range and 0-03 as to bearing.

## Preparing the Device for Use

### 1. When polar coordinates are used:

-- the upper goniometer scale of the circle is marked off as a function of the given grid bearing of the principal direction of fire ( $\alpha_{OH}$  with respect to the center of the goniometer sector);

-- points (position) of the battle formation are entered on the circle: КНП -- center of circle; ОП -- relative to grid bearing of base ( $\alpha_B$ ) and the base (Б), using the upper goniometer scale of the circle and the scale of the base on the plotting board (the value of  $\alpha_B$  is not changed by 30-00).

### 2. When working with rectangular coordinates:

-- the upper scale of the circle is marked off as a function of the grid bearing of the main direction of fire and, by rotating the circle opposite the main indicator, one of the grid bearings close to the grid bearing of the principal direction is established (0-00, 15-00, 30-00, 45-00);

-- on the coordinate scales the fire position is entered on the circle. The ГРП or ГПП [expansions unknown] can be constructed on the range rule of the device in any case.

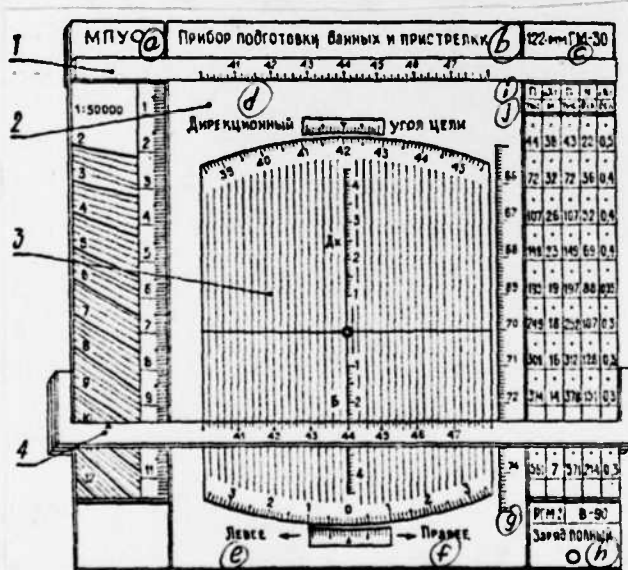


Fig. 1

Key: a. МПУО [expansion unknown] b. Data Reduction Device for Firing and Ranging c. 122-mm GM-30 d. Grid bearing of target e. To the left f. To the right g. RGM-2 h. Total charge i. Ranging,  $\Delta X_t$ , ranging,  $N$ ,  $\Delta N_1$  j. thousands, meters, thousands, divisions, divisions

3. In the absence of the coordinates of the fire position and the КНП [command and observation post].

Most often, this situation is the case in a locale that is sparse in contour points (deserts, steppe, mountains). In this instance, first a shot with a smoke round is fired with the principal weapon of the battery in the direction and to the range ensuring a burst of the round near the targets.

On spotting a burst, for this same weapon a group of four shots with fragmentation (smoke) rounds is designated at a pace enabling each burst to be triangulated:

- from the results of the triangulation, the center of the group of bursts ( $\mathcal{U}\Gamma\text{P}$ ) is entered on the circle with respect to  $\alpha_p$  and  $\Delta_k$ ;

- on the lower goniometer scale the value of the ranging map shift is established, transferred to the fire position for executing the shots;

- the working section of the upper transverse rule of the base is aligned with the point of the burst group center;

- the section of the cursor is set at the value of the command firing range on the range rule. Opposite the point  $\mathcal{U}\Gamma\text{P}$ , the position (point) of the fire position is entered on the circle in the vertical plane at the cursor section.

#### Working with the Device

1. When determining the initial data for firing:

- the target point is entered on the scale with respect to  $\alpha_u$  and  $\Delta_k$ . To do this, the value of  $\alpha_u$  on the circle is aligned with the fixed vernier, that is,  $\alpha_u$  is set by rotating the circle, and opposite the value of  $\Delta_k$  the target point  $\mathcal{U}$  is designed on the circle (Fig. 2 a);

- by rotating the circle the points  $\mathcal{U}$  and  $O\text{П}$  [fire position] are aligned in the vertical plane, using the vertical lines of the plotting board (Fig. 2 c, d);

- the working section of the transverse rule of the base is aligned with the target point, and the section of the cursor with the  $O\text{П}$  point. On the range rule one reads off the range, and on the right rule, the sighting,  $\Delta x_{\text{тлс}}$  and other data (Fig. 2, c, d, f, g);

- from the lower goniometer scale one reads off the map shift to the target (Fig. 2 h);

- $K_y$  and  $\mathcal{W}_y$  are determined in the usual way.

To determine the correction for the displacement ( $\text{ПC}$ ), one must recall the  $\text{HK}\mathcal{U}$  angle and the  $\partial_{OH}$ . If the senses of these quantities are different,

then the  $\Pi C$  is equal to the sum of the absolute magnitudes of the angles; if the senses of these quantities are the same, the  $\Pi C$  is equal to the difference of the absolute magnitudes of these angles.

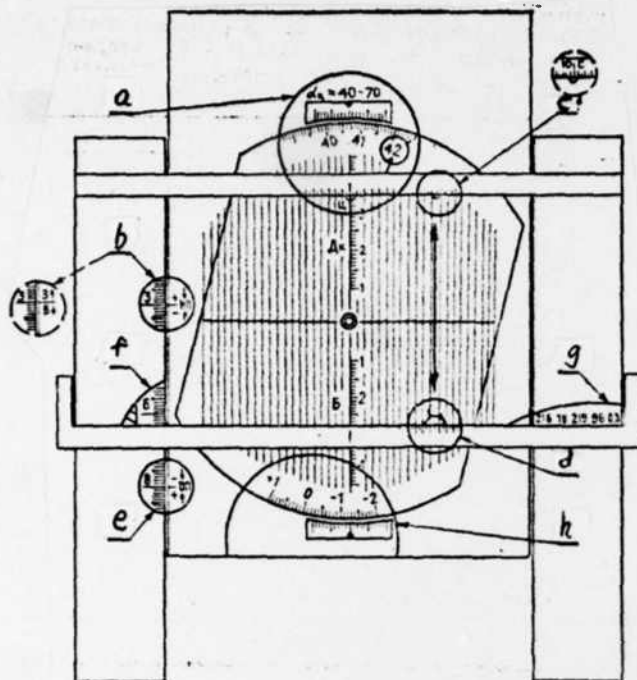


Fig. 2

## 2. When ranging targets ( $\Pi C \geq 5-00$ ):

-- after entering the target point on the plotting board opposite the main indicator, at the top the grid bearing of the target is entered (Fig. 2a), and opposite the any left integer on the range rule (for example, opposite 3000 m), with the section of the transverse rule of the base aligned with the target point, the  $H\Pi$  mark and the senses "+" and "-" are also entered (Fig. 2b);

-- after the target point is aligned with the  $O\Pi$  point, in the vertical plane the original data for firing are determined (Fig. 2 c, d, f, g, h), and opposite any range value (for example, 8000 m) the  $O\Pi$  marked and the senses "+" "-" are positioned (upper transverse line is aligned with the target point).

The correction of the direction is determined from the formula

$$\Delta\delta = \delta_u - \delta_p.$$

3. When ranging a target using a helicopter with successive checks by the points of the compass (the navigator determines the target coordinates are determined in the rectangular system, and the  $O\Pi$  can be entered with respect to  $\alpha_B$  and  $B$ ):

-- to determine the original data for firing at a target, the  $ON$  mark and the senses are entered (see the section on target ranging when  $NC \geq 5-00$ );

-- the circle is positioned so that opposite the main indicator is one of the grid bearings (0-00, 15-00, 30-00, 45-00) close to the given grid bearing of the principal direction of fire. The target is entered on the circle and the working section of the upper transverse rule is aligned with the target point;

-- opposite 3000 m or another value on the plotting board (Fig. 2b) and the target point on the transverse rule the marks and the designations of the cardinal points (Fig. 2c) are entered.

The direction correction is determined from the above-presented formula.

4. When setting up a reference point (when ranging):

-- prepare the original data in the usual way;

-- from the triangulation data enter the burst group center on the circle;

-- by rotating the circle along the lower goniometer scale, set the ranged map shift from the principal direction. In this position, with the aligned section of the upper transverse rule with the burst group center point of the reference point, set a fictitious  $ON$  point in the vertical plane for the ranged distance;

-- the switching of fire is executed from the fictitious  $ON$  point and the principal direction with allowance for the difference of the corrections to the drift.

After ranging the actual reference point, the device can be operated just as for the  $NYO$  with the "k" mark entered on the cursor.

When firing at moving targets and setting the  $H30$  and  $N30$ , special rules (templates) must be used, just as for the  $NYO$ .

In conclusion it can be noted that the device is simple to construct. The small dimensions and weight (compared with the  $NYO-9$ ) and the adequate accuracy of the quantities determined enable it to be used in executing fire missions and in monitoring data reduction for  $ON$ . Many artillery officers in our unit have already constructed these devices and are using them with success in combat firings and in teaching situations.

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